RESEARCH PROBLEM STATEMENT #DC-602

I – Problem Title
Identifying factors that determine bicycle and pedestrian-involved collision rate and affect bicycle and pedestrian demand at multi-lane roundabouts.

II - Research Problem Statement
Many factors influence the rate of collisions involving bicyclists or pedestrians, but some roundabouts may create special difficulties for those users. Roundabouts are common in Europe and are being used more frequently as intersections in the United States. As bicycle use continues to increase and roundabouts become more common in the U.S., bicycle and pedestrian - involved collisions may become a larger traffic safety issue. The factors that influence the frequency and severity of those collisions may include roundabout geometry, vehicular volumes, speed differential between motor vehicles and bicycles, operating position of bicyclists, signing, and striping. In order to improve bicycling and walking safety, transportation professionals need to better understand the factors that influence bicycle and pedestrian-involved collisions and demand in the United States, at both conventional and multi-lane (2 or more lanes) roundabouts.

III - Objective
This results of the research will help Caltrans develop and improve multi-lane roundabout design and operations guidance to optimize bicyclist and pedestrian safety and mobility by identifying the factors that determine bicycle and pedestrian-involved collision rates and influence bicyclists' and pedestrians' decision to use or avoid multi-lane roundabouts.

IV – Background
The majority of studies of roundabouts in Europe, England and Australia indicate that multi-lane roundabouts have a much higher than expected rate of bicycle-involved collision rates, compared to comparable conventional intersections and to single lane roundabouts. There are reports that bicyclists and pedestrians avoid multi-lane roundabouts in some of these countries because of safety and mobility concerns. However, these studies did not identify the factors, other than roundabout size, that determined collision risks or bicyclist or pedestrian decisions to use or avoid a roundabout. This research will provide more definitive information.

V – Estimate of Duration of Research
Depending on the scope of the research; 24 to 36 months.

VI – Statement of Urgency and Benefits
Urgent. Improving non-motorized mobility supports Caltrans Strategic Goals and federal and state policy directives (U.S. DOT Policy Statement: Accommodating Bicycle and Pedestrian Travel; DD-64, Accommodating Nonmotorized Travel; The California Blueprint for Bicycling and Walking). The Blueprint calls for a 50% increase in walking and bicycling trips and a 50% decrease in bicyclist and pedestrian fatality rates by 2010. Ensuring that bicyclists and pedestrians can confidently and safely use roundabouts is key to meeting these goals.

VII – Related Research
Prior non-U.S.A. studies have studied bicycle collisions/collision rates at multi-lane roundabouts, but did not identify the factors that influence these rates or bicyclists' decisions to use or avoid roundabouts. More research is also needed to determine what design features affect the ability of pedestrians, especially children, the elderly, and people with disabilities, to confidently use multi-lane roundabouts.

VIII – Deployment Potential
All state highways and local roads, with application to other states.